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Two new species of tortricids attacking conifers in the northwest part of China (Lepidoptera)

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Abstract Two new tortricid pests of conifers are described from China: *Epinotia tianshanensis* Liu & Nasu, sp. nov. and *Zeiraphera gansuensis* Liu & Nasu, sp. nov. Adults, genitalia and immature stages are figured. Some bionomic notes are also given.

Key words Tortricidae, Olethreutinae, *Epinotia tianshanensis* Liu & Nasu, sp. nov., *Zeiraphera gansuensis* Liu & Nasu, sp. nov., new conifer pests in China, immature stages.

Two serious tortricid pests of conifers have recently been found in the northwest part of China. As a result of examination, we have concluded that these two represent two new species. In this paper, they are described with illustrations of adults, genitalia and immature stages, and the biological notes are also given.

Epinotia tianshanensis Liu & Nasu, sp. nov.

Epinotia sp.: Meng, 1992: 29.

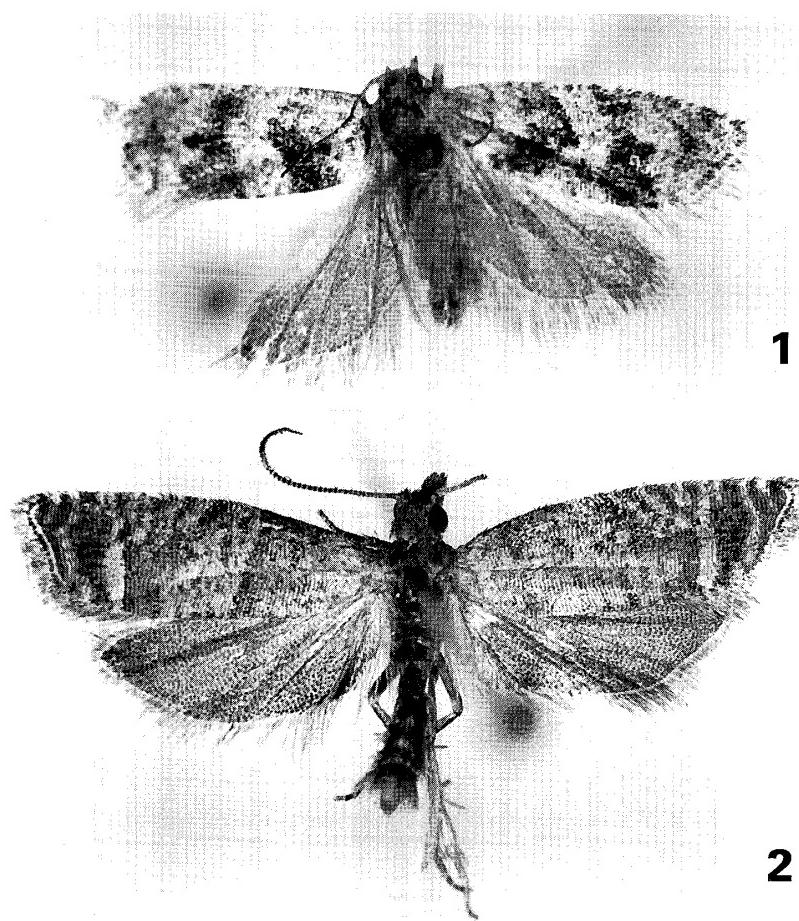
Adult (Fig. 1). Length of forewing 4-5 mm. Head grayish yellow. Antenna grayish yellow, with dark brown annulations. Labial palpus short, grayish yellow. Thorax grayish brown. Forewing without costal fold. Ground color dark brown. Costa with five pairs of whitish strigulae from apex to basal 1/3. Grayish yellow streaks originating from the pairs of costal strigulae; of these streaks the first two confluent below apex, running along termen to tornus, the third wide, sinuous, reaching to tornus. Basal patch indicated by two or three sinuous grayish yellow streaks, occupying basal 1/5. Median fascia consisting of two wide sinuous grayish yellow streaks, originating from the fourth and fifth pairs of costal strigulae, running outwardly to the middle of wing, thence turned inwardly to the middle of dorsum. Cilia grayish brown, with a dark basal line. Hindwing light grayish brown; cilia paler, with a dark basal line.

Male genitalia (Fig. 3). Uncus short, bifurcated terminally. Socius slender, protruded dorsally. Henion conspicuous. Valva rather broad, with small oval cucullus. Aedeagus slender, armed with 11-13 cornuti.

Female genitalia (Figs. 5, 6). Antrum cup-shaped (Fig. 6). Ductus bursae long sclerotized medially. Corpus bursae globular, spinulose on inner surface; two long blade-like signa situated laterally, different in size.

Material examined. Holotype. ♂, Tianshan Mts. (2,050-2,200 m), Xinjiang Uygur Autonomous Region, 25. VII. 1989 (X.Y. Meng leg.). Paratypes. 14 ♂ 11 ♀, same data as holotype. Types are deposited in the Institute of Zoology, Academia Sinica, Beijing, of these three male and three female paratypes in the Entomological Laboratory, the University of Osaka Prefecture, Sakai.

Egg. Oval, punctulate on surface. Color white, dark purple before hatching.



Figs. 1, 2. Adults. 1. *Epinotia tianshanensis* Liu & Nasu, sp. nov., paratype, female. 2. *Zeiraphera gansuensis* Liu & Nasu, sp. nov., paratype, male.

Mature larva. Length 7-8 mm. Head longer than broad, dark brown, with black pigmentation on ocellar area; spinneret slender, with round top. Prothoracic shield and thoracic legs brown. Body grayish white; integument densely granular. Anal plate dark brown. Anal fork absent. Crochets uniordinal; 17-21 on ventral proleg, 14-16 on anal proleg. *Chaetotaxy* (Figs. 9-13): On abdominal segments 1-7, SD1 and SD2 on separated pinacula. On Abdominal segment 9, D2s on same pinaculum; L group bisetose. SV group on abdominal segments 1, 2, 3, 7, 8 and 9 numbering 2, 2, 3, 2, 2, 2, respectively.

Material examined. 4 exs., Tianshan Mts., Xinjiang Uygur Autonomous Region, fixed on 8. VI. 1989 (X.Y. Meng leg.).

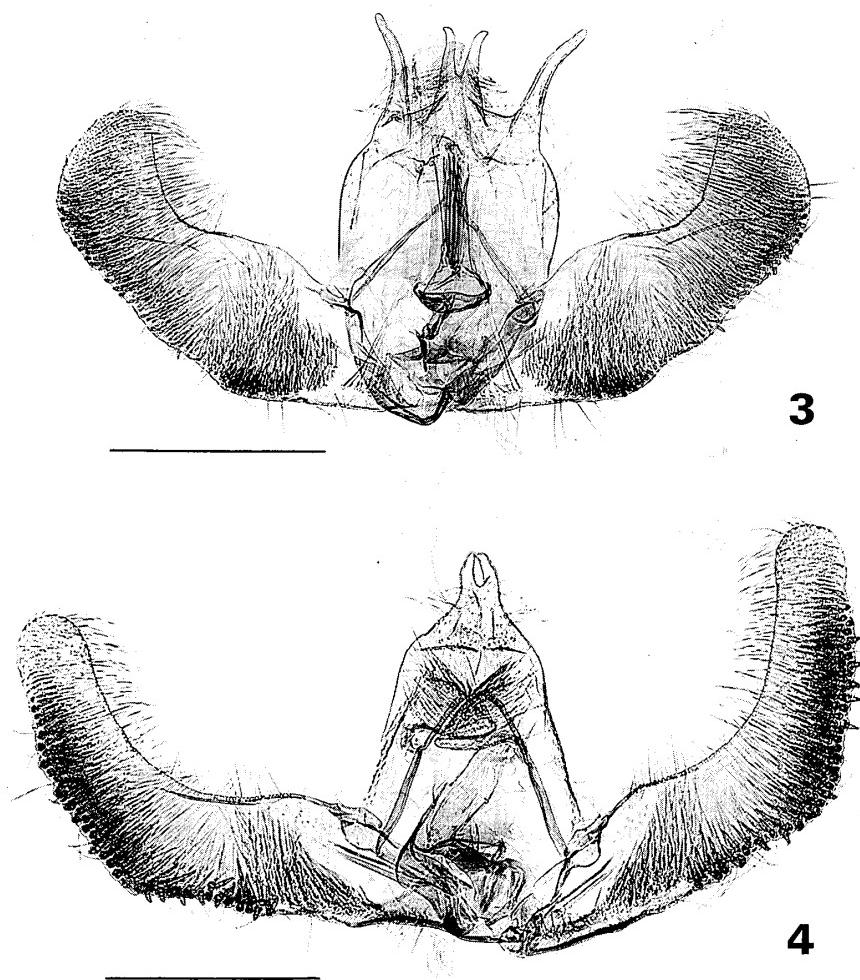
Pupa (Figs. 19, 20). Length 4-5 mm. Color reddish brown. Clypeus with two pairs of setae. Abdominal segment 10 with four pairs of hooked setae.

Material examined. 4 ♂ 3 ♀, Tianshan Mts., Xinjiang Uygur Autonomous Region, fixed on 25. VI. 1989 (X.Y. Meng leg.).

Distribution. China (Xinjiang Uygur Autonomous Region).

Host-plant. *Picea schrenkiana* Fisch. et Mey. (Pinaceae).

Biological note. According to Meng (1992), this moth is univoltine. Eggs are laid singly on the needles in August. Immature larvae overwinter. In next April, larvae injure to the



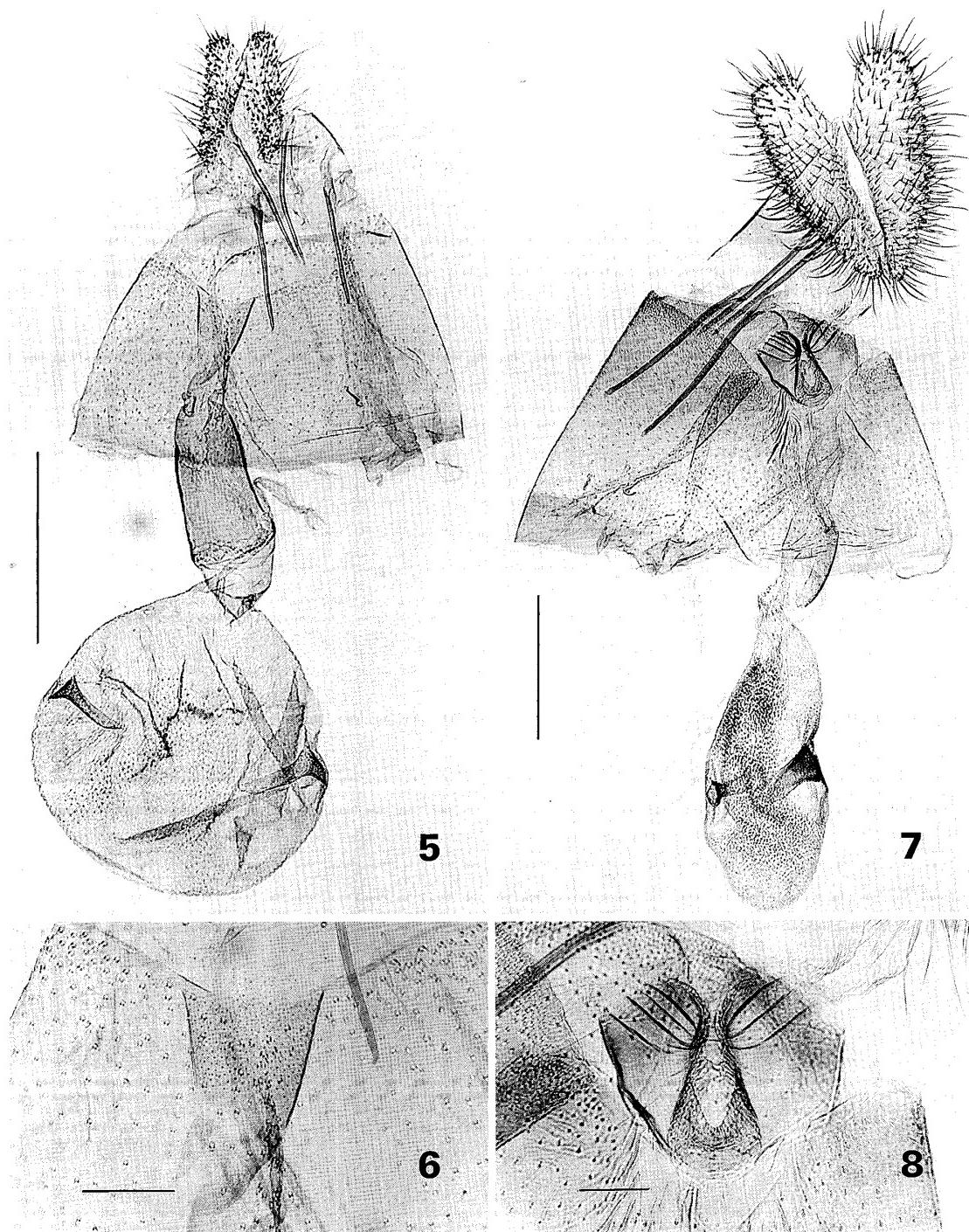
Figs. 3, 4. Male genitalia. 3. *Epinotia tianshanensis* Liu & Nasu, sp. nov., paratype. 4. *Zeiraphera gansuensis* Liu & Nasu, sp. nov., paratype (scales=0.5 mm).

twigs, sticking the needles together with threads and feces. Pupation takes place in the cocoon on twig in early June. Adults emerge in the evening and copulate in the morning in July.

Remarks. This species is similar to *Epinotia rubiginosana* (Herrich-Schäffer, 1851) in general appearance, but differs from it in having shorter forewing, smaller oval cucullus, and cup-shaped antrum.

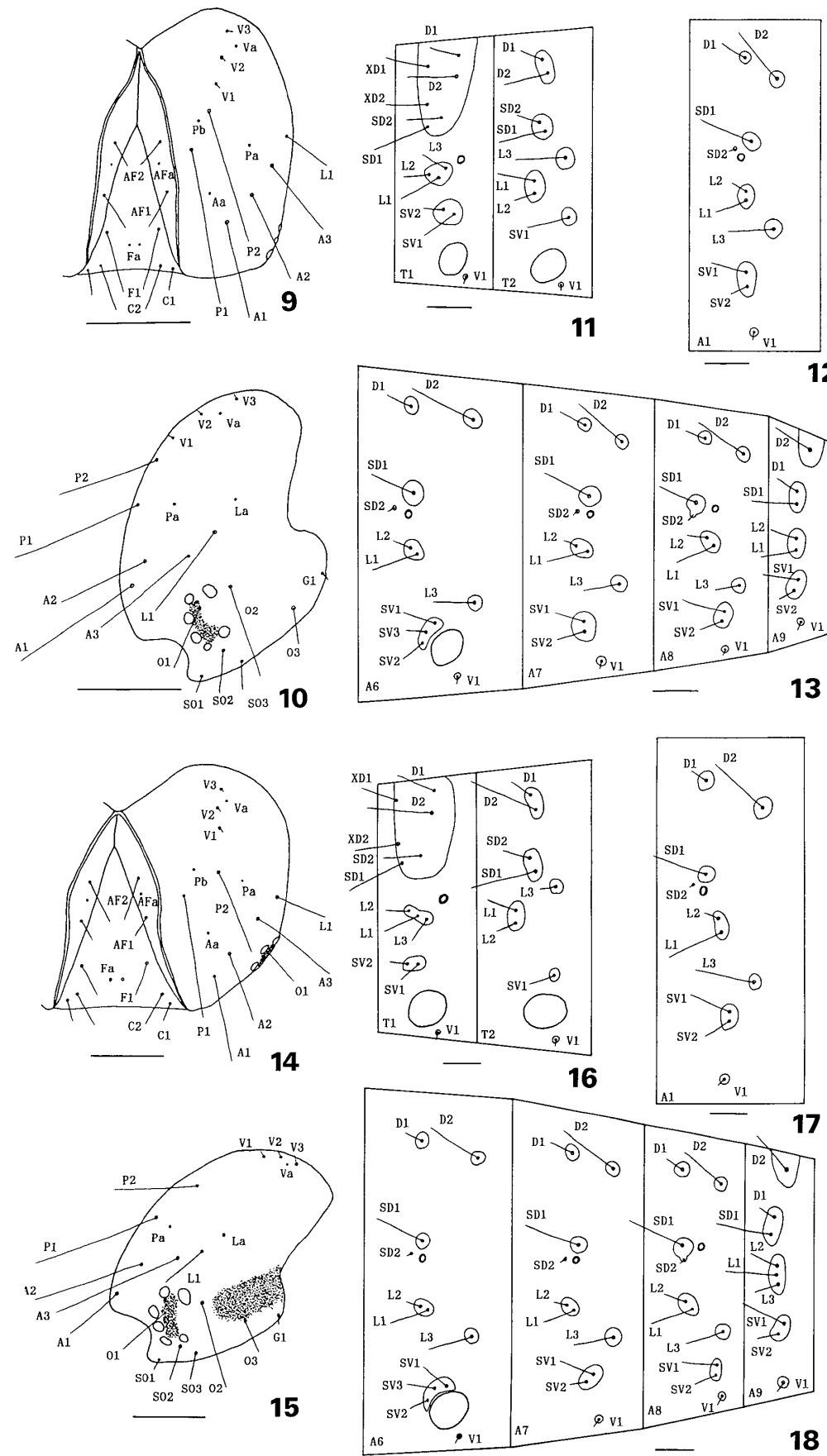
***Zeiraphera gansuensis* Liu & Nasu, sp. nov.**

Adult (Fig. 2). Length of forewing 6-7 mm. Head and labial palpus brownish gray. Antenna brownish gray, with dark brown annulations. Thorax brownish gray. Forewing with costal fold reaching to basal 2/5 of costa. Ground color yellowish brown. Costa with four pairs of whitish strigulae from apex to the middle. Plumbeous streaks originating from the costal strigulae; of these streaks the first reaching to the top of outer plumbeous streak of ocelloid patch, the others confluent at the top of inner plumbeous streak of ocelloid patch. Basal patch indicated by several sinuous gray streaks, occupying



Figs. 5-8. Female genitalia. 5. *Epinotia tianshanensis* Liu & Nasu, sp. nov., paratype. 6. *Ditto*, detail of antrum. 7. *Zeiraphera gansuensis* Liu & Nasu, sp. nov., paratype. 8. *Ditto*, detail of sterigma (scales of Figs. 5, 7=0.5 mm, scales of Figs. 6, 8=0.1 mm).

basal 1/4. Median fascia consisting of several sinuous gray streaks. Ocelloid patch conspicuous, yellowish brown, laterally bordered with plumbeous streaks (inner streak wide), including some black dashes. Cilia brownish gray, with a dark basal line. Hind-wing light grayish brown; cilia paler, with a dark basal line.



Male genitalia (Fig. 4). Uncus short, bifurcated terminally. Socius triangular. Valva elongate, curved dorsally, with well-developed slender cucullus. Aedeagus short, armed with 10–15 cornuti.

Female genitalia (Figs. 7, 8). Papillae anales large, triangular. Ninth and 8th segments short. Sterigma triangular, with some ridges posteriorly (Fig. 8). Ductus bursae tortuously sclerotized medially. Corpus bursae globular, spinulose on inner surface; two horn-like signa with round apices situated laterally, different in size.

Material examined. Holotype. ♂, Taizishan Forestry Center (2,500 m), Linxia County, Gansu Province, 20. VIII. 1990 (T. H. Cheng leg.). Paratypes. 14♂ 32♀, same data as holotype. Types are deposited in the Institute of Zoology, Academia Sinica, Beijing, of these three male and three female paratypes in the Entomological Laboratory, the University of Osaka Prefecture, Sakai.

Egg. Oval, glanular on surface. Color milky white, blackish brown before hatching.

Mature larva. Length 6–7 mm. Head broad, blackish brown, with black pigmentation on ocellar area and galea; spinneret slender, with round top. Prothoracic shield and thoracic legs blackish brown. Body pale yellow; integument densely spinulose. Anal plate blackish brown. Anal fork absent. Crochets biordinal; 26–31 on ventral proleg, 21–24 on anal proleg.

Chaetotaxy (Figs. 14–18): On abdominal segments 1–7, SD1 and SD2 on separated pinacula. On segment 9, D2s on same pinaculum; L group trisetose. SV group on abdominal segments 1, 2, 3, 7, 8 and 9 numbering 2, 2, 3, 2, 2, 2, respectively.

Material examined. 8 exs., Taizishan Forestry Center, Linxia County, Gansu Province, fixed on 30. VI. 1990 (T. H. Cheng leg.).

Pupa (Figs. 21, 22). Length 6–7 mm. Color reddish brown. Clypeus with two pairs of setae. Abdominal segment 10 with three pairs of hooked setae.

Material examined. 10♂ 17♀, Taizishan Forestry Center, Linxia County, Gansu Province, fixed on 29. VII. 1990 (T. H. Cheng leg.).

Distribution. China (Gansu Province).

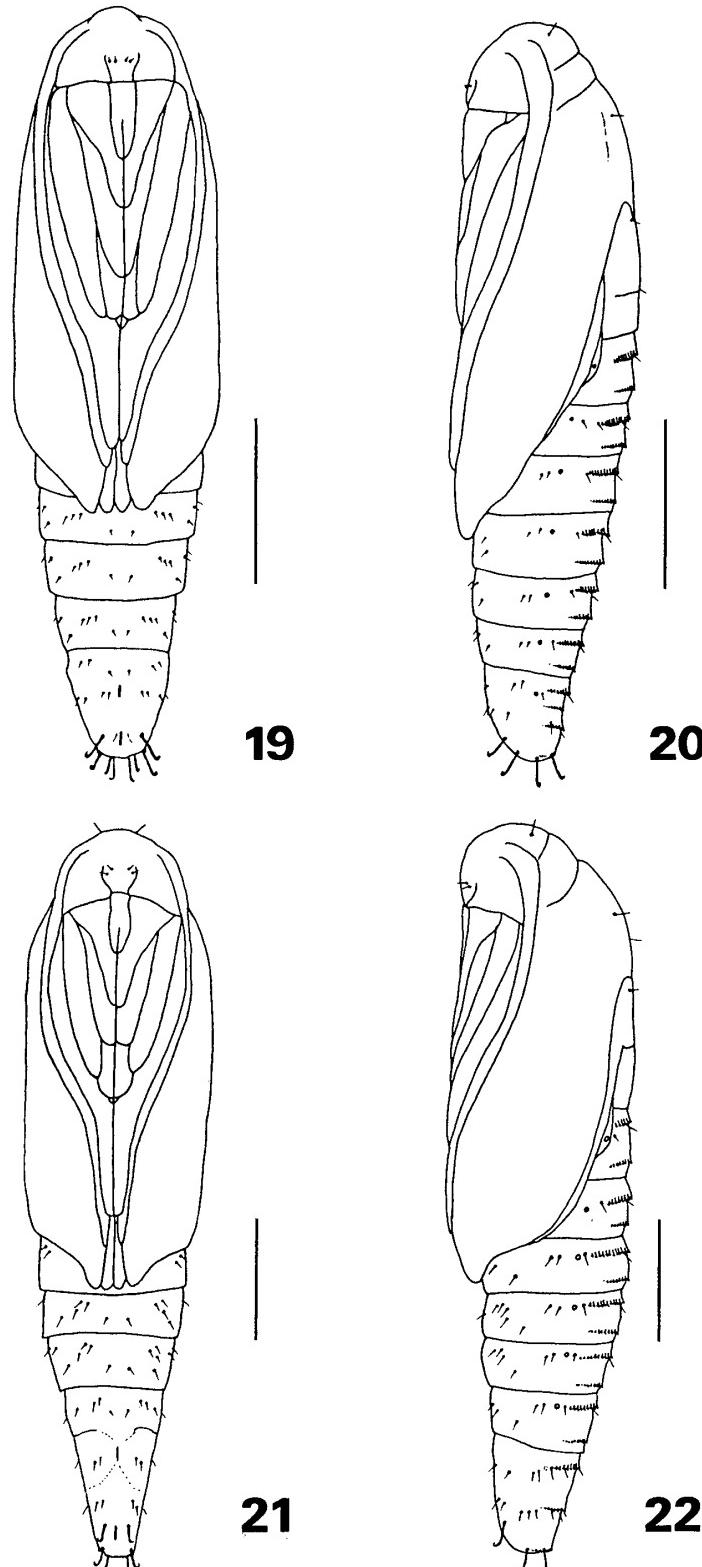
Host-plant. *Pinus tabulaeformis* Carr. (Pinaceae).

Biological note. This moth is univoltine. Eggs are laid singly on the needles in August. Larvae hatch in next May, and feed on the leaf buds, boring into them. Adults emerge in the morning and copulate in the evening in August.

Remarks. This species is superficially similar to *Zeiraphera rufimitrana* (Herrich-Schäffer, 1851), but differs from it in having costal fold, bifurcate uncus, larger papillae anales, shorter 8–9th abdominal segments in female and sterigma with some ridges posteriorly.

Figs. 9–13. Larval chaetotaxy of *Epinotia tianshanensis* Liu & Nasu, sp. nov. 9. Head, frontal view. 10. Head, lateral view. 11. Pro- and mesothoraces. 12. Abdominal segment 1. 13. Abdominal segments 6–9 (scales=0.2 mm).

Figs. 14–18. Larval chaetotaxy of *Zeiraphera gansuensis* Liu & Nasu, sp. nov. 14. Head, frontal view. 15. Head, lateral view. 16. Pro- and mesothoraces. 17. Abdominal segment 1. 18. Abdominal segments 6–9 (scales=0.2 mm).



Figs. 19-22. Pupae. 19. *Epinotia tianshanensis* Liu & Nasu, sp. nov., male, ventral view. 20. *Ditto*, lateral view. 21. *Zeiraphera gansuensis* Liu & Nasu, sp. nov., female, ventral view. 22. *Ditto*, lateral view (scales=1 mm).

Acknowledgements

We wish to express our thanks to Mr. T. H. Cheng of the General Station of Forestry Science Technique and Spreading and Mr. X. Y. Meng of the Xinjiang General Station of Forest Diseases and Pests Control and Quarantine, for the assistance in collecting the specimens. We are especially obliged to Pro. Z. G. Xu of the Qinghai Academy of Agriculture and Forest for his helpful suggestions.

Reference

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摘要

中国北西部において針葉樹を加害するハマキガの2新種（鱗翅目）（劉友樵・那須義次）

最近、中国北西部において、針葉樹に重大な被害を与える2種類のハマキガが発見された。検討の結果、これら2種は新種であることが判明した。

Epinotia tianshanensis Liu & Nasu (新種)

前翅の長さ4-5 mm。雄の前翅に前縁褶はない。前翅の地色は暗褐色、基部、中央部と先端部に灰黄色の帯が横切る。本種は外部表徴では *Epinotia rubiginosana* (Herrich-Schäffer), マツノクロマダラヒメハマキに類似するが、前翅はより短いこと、cucullusはより小さいこと、antrumはコップ状であることで区別できる。

分布：中国（新疆ウイグル自治区）。

寄生植物：*Picea schrenkiana* Fisch. et Mey. ゴダイサントウヒ（マツ科）。

Zeiraphera gansuensis Liu & Nasu (新種)

前翅の長さ6-7 mm。雄の前翅に前縁褶がある。前翅の地色は黄褐色、基部と中央部に灰色の帯が横切る。肛上紋は黄褐色で側方は鉛色線で縁どられており、明瞭。本種は外部表徴では *Zeiraphera rufimitrana* (Herrich-Schäffer), トドマツアミメヒメハマキに類似するが、前縁褶を持つこと、uncusは2叉すること、papillae analesは大きいこと、雌の第8-9腹節は短いこと、sterigmaは何本かの隆起を持つことで区別できる。

分布：中国（甘肃省）。

寄主植物：*Pinus tabulaeformis* Carr. マンシュウアカマツ（マツ科）。

中國西北地區為害針葉樹嫩梢的小卷蛾二新種記述（劉友樵・那須義次）

在新疆天山林區北坡的雪嶺雲杉上有一種葉小卷蛾和在甘肅太子山林區的油松上有一種綫小卷蛾都是為害嫩梢幼芽的害蟲。經研究證明它們都是新種。分別命名為天山葉小卷蛾 *Epinotia tianshanensis* Liu & Nasu, sp. nov. 和甘肅綫小卷蛾 *Zeiraphera gansuensis* Liu & Nasu, sp. nov. 本文對其分類地位、各蟲期主要特徵，分別進行詳細的製圖和描述。除文中註明2種各3對副模標本存日本大阪府立大學昆蟲試驗室外，其地模式標本均保存在中國科學院動物研究所標本館。

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